

Work Order ID 69299

Friday, May 06, 2011 3:49:20 PM



Page 1

Item ID: D412-664-203

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Aft

Start Date: 5/9/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 6/3/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: MF Date: 11-05-06

Tooling:

Date:

QC:

Date:

SPG (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Setup/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	---------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D412-664-243

E

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D412-664-203 CHG 006

CHG 006

11/5/5
11-5-18

110

0.00



Packaging

Packaging

Memo

0.00

Packaging

11-5-9

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D412-664-243 using CNC bender program 412-aft and Folio FT010

11-5-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Customer:

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130



QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

Sulosly

x1

Memo

0.00

140



Crosstubes

Crosstubes

Crosstubes

0.00

0.00

Memo

1-Drill pilot holes in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551 and drill table DT8577 using #9 holes as per QSI 10 to install towers.

2-Ream hole to finish size in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-SCRIBE PART # & BATCH #

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243

SAO
11-05-11DP
11-5-12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 HandFXtube	Crosstubes Chemical Conversion	0.00							
	Memo	0.00							
	Hand Finishing Crosstubes								
160 QC	QC3- Inspect Part Finish	0.00							
	Memo	0.00							
	Quality Control								
170 QC	QC5- Inspect part completeness to step on W/O	0.00							
	Memo	0.00							
	Quality Control								

W/O:		WORK ORDER CHANGES					
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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210

0.00



SprayPaint

0.00

SprayPaint

Memo

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per DEO D412-664-243 and QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

PAINT:

Start Time: _____

Finish Time: _____

Paint as per DEO 412 664 243-E-1

220

0.00



QC14- Inspect Spray Paint

0.00

QC

Memo

Quality Control

Then, Wrap in plastic bag to protect from scratches

+L

P105-14

P105-14

8/11/05/16

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

Assemble as per Dwg D412-664-203

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

2-Install support with magnobond as per QSI 015 Adhere for for 12 Hrs

A/R 6398 Magnobond Batch: 116677Expiry Date: 11-06

3-Install chafing shield and clamps as per DEO D412-664-243 using installation jig DT9024 Torque clamps to 80-100 in lb.

A/R Proseal batch: 11751085 11-05-17

240

0.00



QC

QC5- Inspect part completeness to step on W/O

Memo

0.00

Quality Control

Sulosh

40

W/O:		WORK ORDER CHANGES					
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Cust Item ID:

Required Date: 6/3/2011 Req'd Qty: 1.00



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Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

250

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

11/5/11

260

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

A

11/5/11

270

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D412-664-203
*****Ensure tube is not packaged if curing time is less than 12 hrs, see step 27
for application time & date *****
Time & date of packaging: 7
Location: _____

Purifier C

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Start Date: 5/9/2011 Start Qty: 1.00



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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/5/19 JG

11-05-19
C

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

Friday, May 06, 2011 3:49:13 PM

Page 1

Work Order ID: 69299

Parent Item: D412-664-203

Parent Item Name: Crosstube Aft






Start Date: 5/9/2011

Required Date: 6/3/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat; Added D3189-1 K/DS
 IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
 IPP Rev:G 06.12.08 per ECN 886 EC
 IPP Rev:H 07-04-30 As per Rev D JLM
 IPP Rev:I 08-06-12 add comment in seq. 21 DD verified by:EC IPP rev
 G 11.04.21 DEO D412-664-243-E-1 EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status																		
AN6-40A  Bolt		Purchased	No			250	Each	114.0000	4	4																					
<table><tr><th>Location</th><th>Loc Qty</th><th>Loc Code</th></tr><tr><td>ST340</td><td>80</td><td></td></tr><tr><td>117366</td><td>80</td><td></td></tr><tr><td>ST343</td><td>34</td><td></td></tr><tr><td>115905</td><td>14</td><td></td></tr><tr><td>116549</td><td>20</td><td></td></tr></table>														Location	Loc Qty	Loc Code	ST340	80		117366	80		ST343	34		115905	14		116549	20	
Location	Loc Qty	Loc Code																													
ST340	80																														
117366	80																														
ST343	34																														
115905	14																														
116549	20																														
AN6-41A  Bolt		Purchased	No			250	Each	67.0000	2	2																					
<table><tr><th>Location</th><th>Loc Qty</th><th>Loc Code</th></tr><tr><td>ST344</td><td>67</td><td></td></tr><tr><td>115316</td><td>17</td><td></td></tr><tr><td>117366</td><td>50</td><td></td></tr></table>														Location	Loc Qty	Loc Code	ST344	67		115316	17		117366	50							
Location	Loc Qty	Loc Code																													
ST344	67																														
115316	17																														
117366	50																														
AN960JD616  Washer	NAS1149D0663J	Purchased	No			250	Each	0.0000	18	18																					

W/O:		WORK ORDER CHANGES					
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Picklist Print

Friday, May 06, 2011 3:49:13 PM

Work Order ID: 69299

Parent Item: D412-664-203

Parent Item Name: Crosstube Aft

Start Date: 5/9/2011

Required Date: 6/3/2011

Start Qty: 1.00

Required Qty: 1.00

D2896-1

Manufactured No

67742

230

Each

21.0000

1

1

ST 11-05-17
~~67742~~ +



Support

Location

Loc Qty

Loc Code

LG052

21

58356

3

67742

18

x1

D3189-1

Manufactured No

230

Each

24.0000

2

2

ST 11-05-17



Chafing Shield

Location

Loc Qty

Loc Code

FG

4

36065

4

LG053

20

63982

16

67587

4

x2

D3595-063-570

Manufactured No

230

Each

35.0000

2

2

ST 11-05-17



RUBBER CUSHION

Location

Loc Qty

Loc Code

FG

15

37971

1

42243

12

LG055

22

42243

1

63406

21

x2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Work Order ID: 69299

Parent Item: D412-664-203

Parent Item Name: Crosstube Aft



Start Date: 5/9/2011

Required Date: 6/3/2011

Start Qty: 1.00

Required Qty: 1.00

D412-664-203TRN

Manufactured

No

110

Each

1.0000



Crosstube Turning Detail

B69249



1

1

11-5-9

Location

Loc Qty

Loc Code

LG003

1

67272

1

MS21042L6

Purchased

No

250

Each

322.0000



Nut



6

11/5/18

Location

Loc Qty

Loc Code

ST300

322

116548

22

117343

300

MS21920-28

Purchased

No

230

Each

74.0000



Clamp(per MIL-DTL-8783C)



4

11-05-17

Location

Loc Qty

Loc Code

FG

5

105884

5

LG050

69

116839

19

117344

50

MS21920-30

Purchased

No

230

Each

70.0000



clamp(per MIL-DTL-8783C)



2

11-05-17

Location

Loc Qty

Loc Code

LG050

20

109181

20

LG051

50

111258

50

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

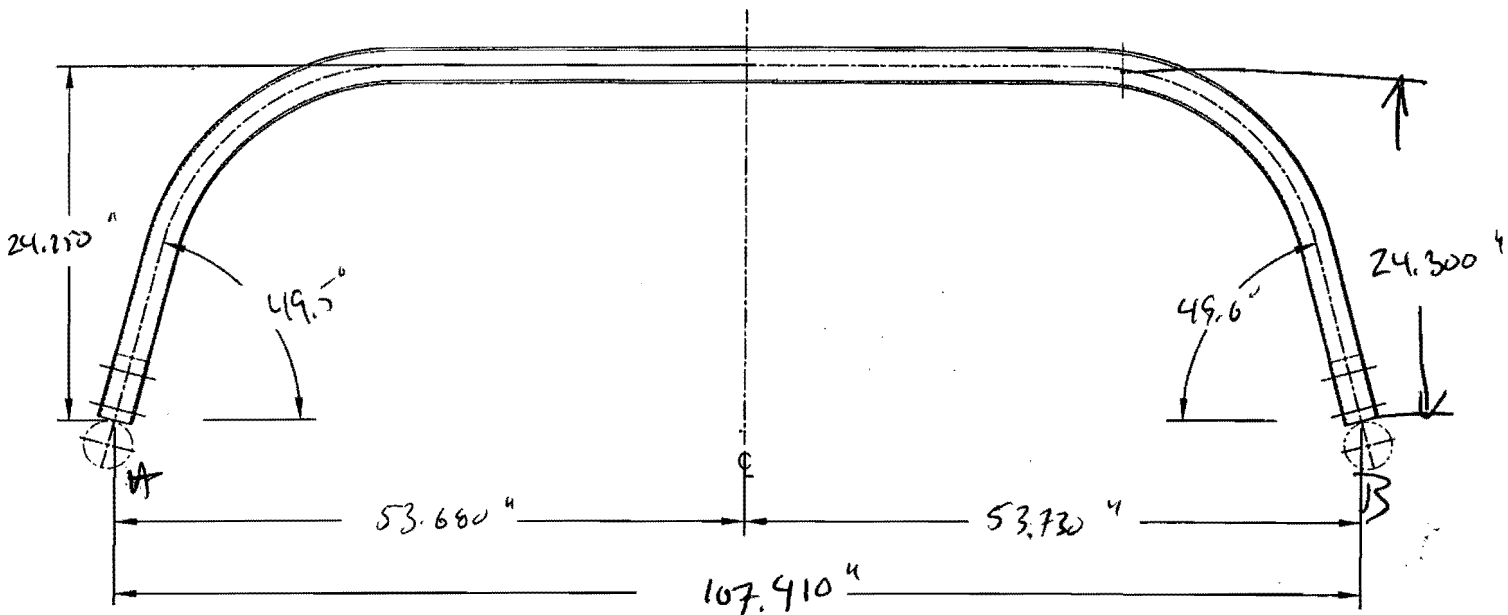
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	6 9299
Description: Crosstube High Aft (412)		Part Number:	D412-664-203
Inspection Dwg: D412-664-243 Rev: E		Page 1 of 1	

Required Dimension	Min	Max
Height	24.24	24.50
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70



Comments

QC15 Inspection	S
Date	11/05/14

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. D	KJ/JLM	
C	10.02.02	Dwg Rev updated	KJ	

W/O:

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Item	Qty -243	Part Number	Description
1	X	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
2	1	D6009-129	CROSSTUBE
3	2	D3595-063-570	RUBBER CUSHION
4	1	D2896-1	SUPPORT
5	2	D3189-1	CHAFING SHIELD
6	2	D2856-600-1009	ABRASION STRIP
7	4	MS21920-28	CLAMP
8	2	MS21920-30	CLAMP (OR MS21920-32)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6009-129
FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 47.0 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

#19 299

DEO ATTACHED

RELEASED
2009-10-29

E	REFORMAT/REVISE GENERAL NOTES; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); ADD TOLERANCE (ZN B6-3, C4-3, C8-3 & C5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	09.09.30
D	REMOVE D2732-058, CHANGE TO D3595-063-570	PH	07.03.09
C	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398, MS21920-32 WAS MS21920-30	MB	06.10.27
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKID TUBES	PH	05.02.04
A	NEW ISSUE	PH	01.10.17
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. E
MFG. APPR.	DS	D412-664-243	SHEET 1 OF 4
APPROVED	140	TITLE	SCALE
DE APPR.	TH	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2001 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

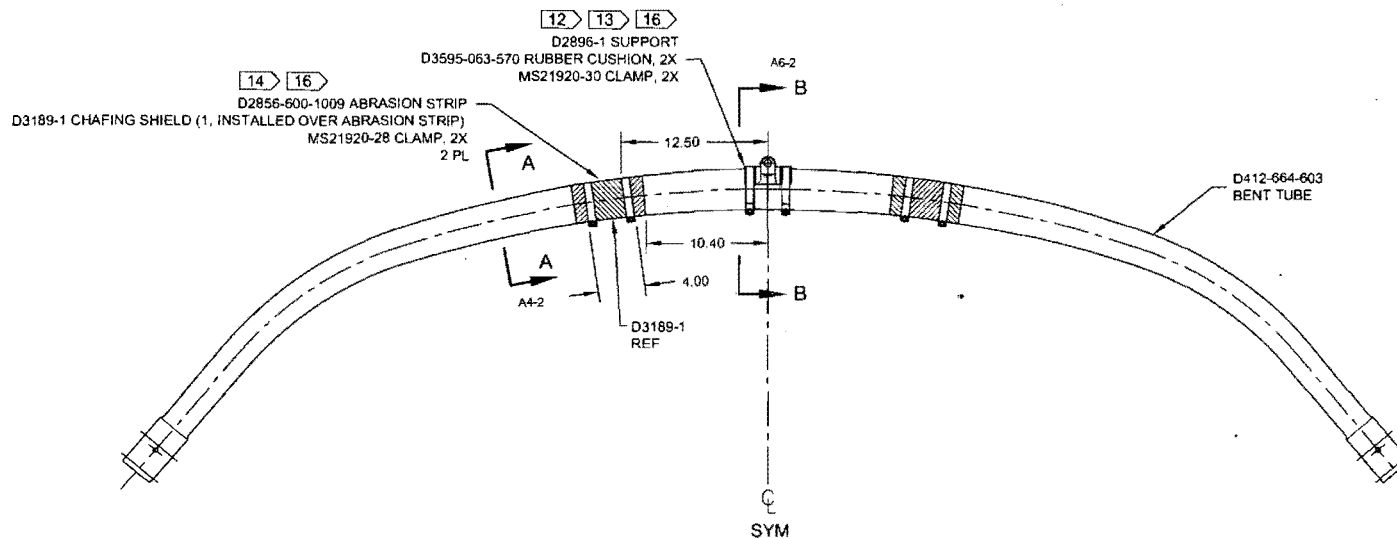
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

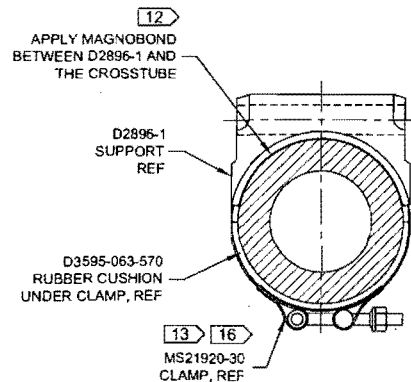
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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

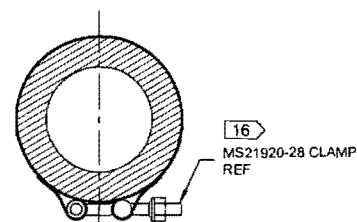
NOTE: Date & initial all entries



D212-664-243
ASSEMBLY DETAIL



SECTION B-B D4-2
SCALE 4X



SECTION A-A C6-2
SCALE 4X

DEO ATTACHED

RELEASED
2009-10-29
NRP

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9P	DRAWING NO.	REV. E
MFG. APPR.	18	D412-664-243	SHEET 2 OF 4
APPROVED	18	TITLE	SCALE
DE APPR.	18	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

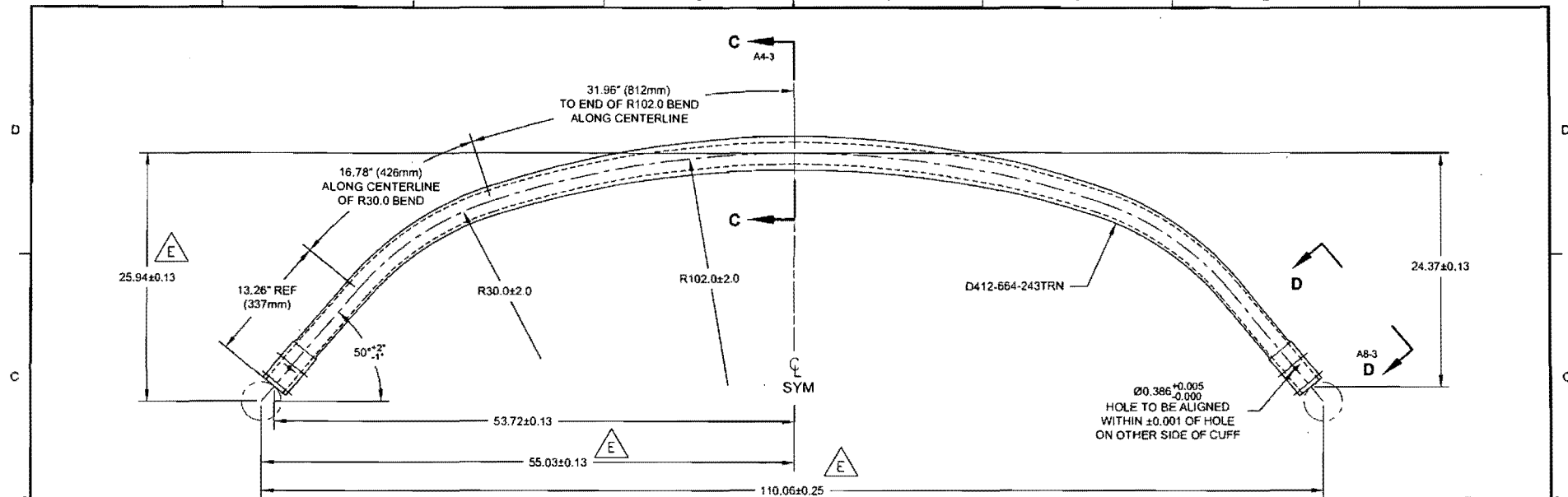
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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

8 7 6 5 4 3 2 1



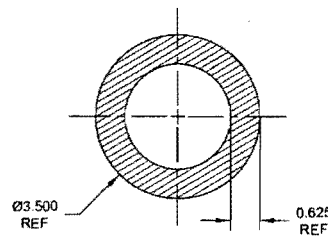
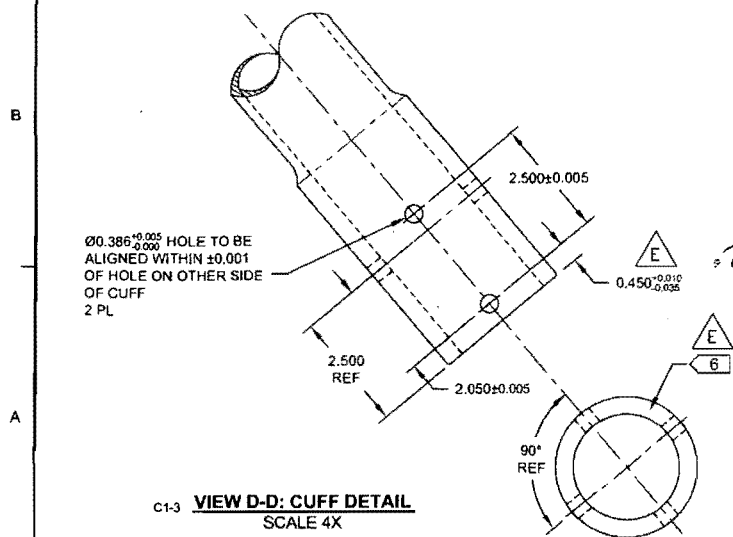
D412-664-603
BENDING AND DRILLING DETAIL

#69249

DEO ATTACHED

RELEASED
2009-10-29

MP



DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PS	DRAWING NO.	REV. E
MFG. APPR.	PS	D412-664-243	SHEET 3 OF 4
APPROVED	PS	TITLE	SCALE
DE APPR.	PS	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2001 BY DART AEROSPACE LTD	
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8 7 6 5 4 3 2 1

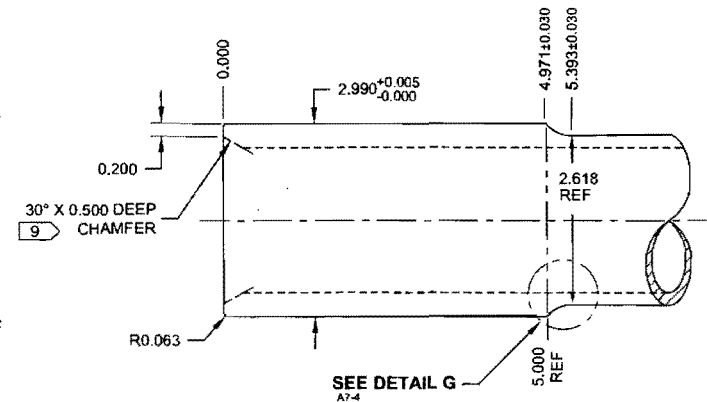
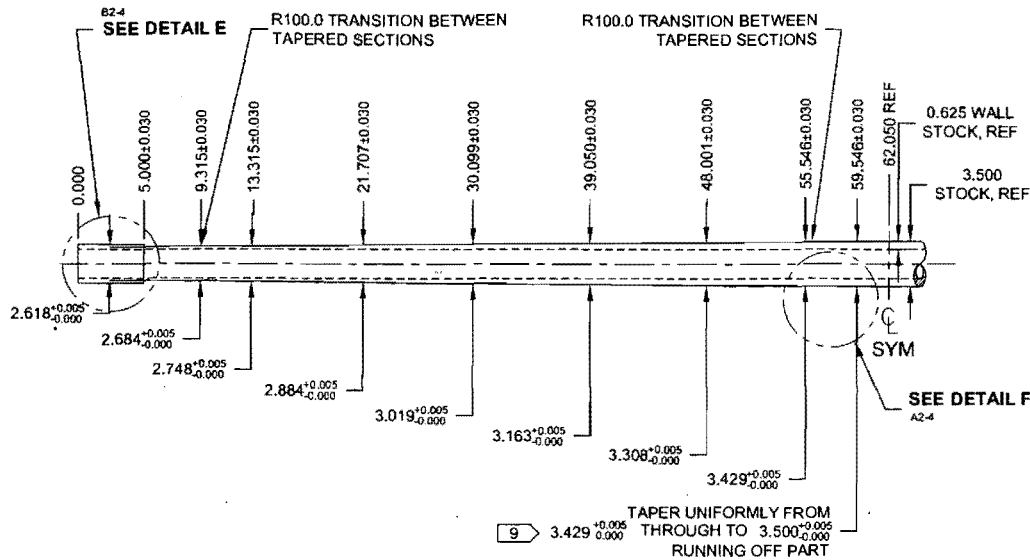
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

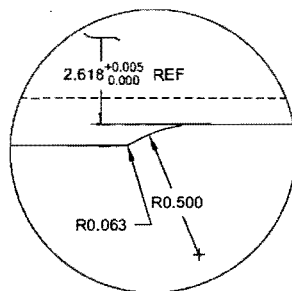
NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

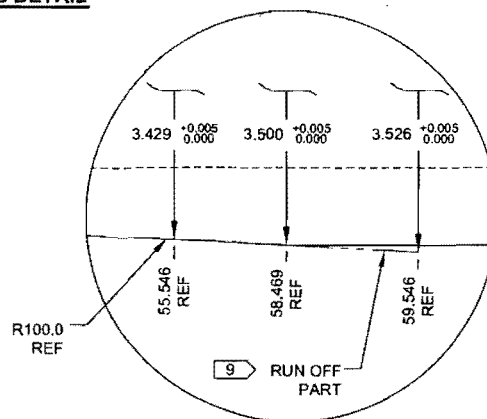


DETAIL E:
CROSSTUBE CUFF D8-4
SCALE 5X

D412-664-243TRN
TURNING DETAIL



DETAIL G:
CUFF TRANSITION C2-4
SCALE 10X



DETAIL F:
TAPER RUN-OFF C4-4
NOT TO SCALE

#69299

DEO ATTACHED

RELEASED
2009-10-29
MTP

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. E
MFG. APPR.	10	D412-664-243	SHEET 4 OF 4
APPROVED	10	TITLE	SCALE
DE APPR.	10	CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2001 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS NOT TO BE REPRODUCED OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D412-664-243	TITLE CROSSTUBE ASSEMBLY (412 HI AFT)	REV. E	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D412-664-243-E-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.03.31	DATE 11/03/31	DATE 11.03.31	DATE 11/03/31	DATE 11.03.31			

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Item	Qty -243	Part Number	Description
6	0	D2856-600-1009	ABRASION STRIP

WAS:

6	2	D2856-600-1009	ABRASION STRIP
---	---	----------------	----------------

NOTES 2 AND 14, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, APPLY CLEAR COAT ON HATCHED AREA
- 14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1
CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL
PROSEAL D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF
PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF
CROSSTUBE PER QSI 035.

#69299
RELEASED
2011-04-07
WJD

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D412-664-243	TITLE CROSSTUBE ASSEMBLY (412 HI AFT)	REV. E	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D412-664-243-E-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.		
DATE 11.03.31	DATE 11.03.31	DATE 11.03.31	DATE 11.03.31	DATE 11.03.31		

IS:

D3189-1 CHAFING SHIELD (1, INSTALLED OVER PROSEAL 890)
MS21920-28 CLAMP, 2X
2 PL

D412-664-603
BENT TUBE

2.00
1.00

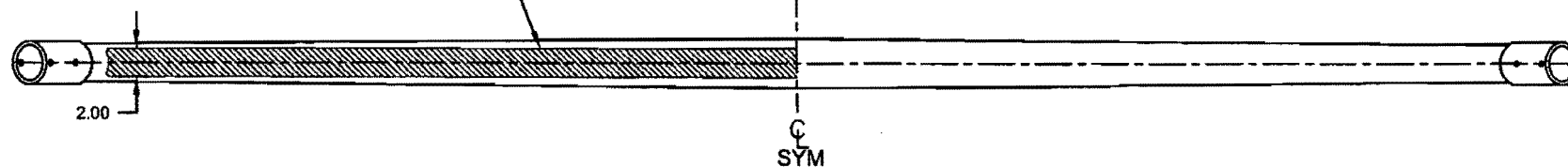
WAS:

D2858-600-1009 ABRASION STRIP
D3189-1 CHAFING SHIELD (1, INSTALLED OVER ABRASION STRIP)
MS21920-28 CLAMP, 2X
2 PL

D3189-1
REF

**D412-664-243
ASSEMBLY DETAIL**

2
MASK AREA PRIOR TO PAINTING AND
APPLY CLEAR COAT AFTER PAINTING



RELEASED
2011-04-07
W

#69299

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



LIQUID PENETRANT TEST REPORT

P- 05608

PAGE 1 OF 1
TIME AM ☒ PM ☐

CLIENT: DART AEROSPACE DATE: MAY-13-2011
ATTENTION: LINDA LACELLE / CHANTALE / JIAN ACUREN JOB NO. 188-11-02126
ADDRESS: 1270, ABERDEEN RD PO/VO NO. 14084
HAWKESBURY, ON WORK LOCATION: AS ADDRESS
ACCEPTANCE STD. ASTM E1417/4051-03B REV./DATE 2005
PROJECT: WET FLUORESCENT LIQUID PENETRANT INSPECTION ON 6 X "CROSSTUBES"
ITEM(S) EXAMINED: SEE BELOW

JOB DESCRIPTION: _____ PROCEDURE NO. LT-002 REV./DATE 2008 TECHNIQUE NO. LT-003 REV./DATE 2008
ART NO. _____ MATERIAL Aluminum THICKNESS N/A
SCOPE: PERFORMED A WET FLUO L.P.I. ON 100% ON THE EXTERNAL SURFACE ON 6 X "CROSSTUBES"

TEST DETAILS

METHOD: ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND: MAGNA FLUX BLACK LIGHT S/N 13798 ☐ OUTPUT > 1000 μ W/cm² ☒ AMBIENT < 2 fc
ENETRANT: 2K-67 MINIMUM DWELL TIME: 10 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
ENETRANT REMOVER: H₂O MINIMUM DRY TIME: >10 MIN. OTHER: _____
DEVELOPER: SKD-33 MINIMUM DWELL TIME: 10 MIN. LIGHT METER S/N: _____ CAL DUE DATE Aug/05/2011
DEVELOPER TYPE: ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE

SURFACE CONDITION: ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE: ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

ITEM #	DESCRIPTION	TESTED	TESTED BY
1	CROSSTUBE W.O. ID 69298	✓	
2	W.O. ID 69299	✓	
3	W.O. ID 69355	✓	
4	W.O. ID 67436	✓	
5	W.O. ID 67557	✓	
6	W.O. ID 67560	✓	

D412-664-203 AFT
D412-664-203 AFT
D412-664-203 AFT
D412-664-203 AFT
D412-664-203 AFT
D412-664-203 AFT

NO RELEVANT INDICATION WAS DETECTED
AS PER APPLICABLE STANDARD

BT 11 04 13

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

Acuren Group Inc. performs the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE: Ron Titley DTR # 644643
TECHNICIAN (SIGNATURE): [Signature] REPORT REVIEWED BY: _____
NAME (PRINT): YVES DESROSIERS NAME: _____ INITIALS: _____
CGSB LEVEL: 2 SNT LEVEL: 2 CGSB LEVEL: _____ SNT LEVEL: _____
CGSB REG. NO: 3049 CGSB REG. NO: _____

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

